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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/717,567	11/21/2003	Atsushi Sadamoto	245770US3RD	8453
22850	7590	10/19/2006		
C. IRVIN MCCLELLAND OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER LEWIS, BEN	
			ART UNIT 1745	PAPER NUMBER

DATE MAILED: 10/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/717,567

Applicant(s)

SADAMOTO, ATSUSHI

Examiner

Ben Lewis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>See Continuation Sheet</u> | 6) <input type="checkbox"/> Other: ____  |

Continuation of Attachment(s) 3. Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date : 11/21/03, 6/25/04, 2/16/05, 1/24/06.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 3,5,7,9,10 and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Yang et al. (U.S. Patent No. 6,635,378 B1).

With respect to claim 1, 3, 5, 7, 9, 10 and 12, Yang et al. disclose a bipolar plate assembly **10** wherein the exemplary bipolar plate **12** includes an oxidant side **16**, having an alternating series of oxidant channels **18** and oxidant side ridges **20**, and a fuel side **22** having an alternating series of fuel channels **24** and fuel side ridges **26**. The oxidant channels **18** include inlets **28** and outlets **30** and the fuel channels include inlets **32** and outlets **34** (Col 4 lines 10-32).

With regard to the main flow paths, Yang et al teach that fuel inlet and outlet manifolds **40** and **42** "main flow paths", oxidant inlet and outlet manifolds **44** and **46** "main flow paths", and coolant inlet and outlet manifolds **48** and **50** are formed in the frame member **38** (Col 4 lines 10-32).

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With regard to two or more branch flow paths with a throttle communication with the main flow path, Yang et al teach that, the cathode plate **62** illustrated in FIGS. 4-6 includes a series of z-shaped channels **64** that extend from the inlet manifold **66** to the outlet manifold **68**. Constrictions **70** "throttles" which are narrower than the z-shaped channels **64**, are formed at the inlet end **72** of each channel.

With regard to first and second separator sets, Yang et al teach that the fuel cell module **74** consists of five cells. More specifically, the exemplary fuel cell module **74** includes a separator plate **76**, a coolant plate **78**, six bipolar plate assemblies **10** (each including a bipolar plate **12** and a frame **14**) and five MEAs **80** that are stacked (Col 6 lines 24-40) (See Figs. 7 and 8).

With regard to fuel and oxidizer supply units, Yang et al teach that the end plate **88** is provided with fuel inlet and outlet ports **100** and **102**, oxidant inlet and outlet ports **104** and **106** and coolant inlet and outlet ports **108** and **110**. The ports connect sources of fuel, oxidant and coolant (not shown) to manifolds in the fuel cell modules **74**. Here, the fuel is hydrogen and the oxidant is oxygen (Col 7 lines 20-31) (See Fig 9).

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2,4, 6, 8, 11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yang et al. (U.S. Patent No. 6,635,378 B1).

With respect to claims 2,4, 6, 8, 11 and 13, the disclosure Yang et al differs from Applicant's claims in that Yang et al. do not disclose that each of the throttles and branch flow paths is configured so that pressure loss at the throttle is larger than 0.5 times of pressure loss at the branch flow path. However, Yang et al. recognize the need for having a pressure drop between each of the throttles and branch flow paths of Yang et al. because Yang et al teach that flow restrictors create a pressure drop sufficient to clear reaction product and condensed humidity from the channels, thereby eliminating the need for the long, tortuous channels, channels of small hydraulic diameter, and excessive flow rates that create the pressure drop in conventional fuels cells (Col 3 lines 14-25). Yang et al also teach that it is also relatively easy to fabricate uniformly sized flow restrictors, which results in uniform pressure differentials and uniform reactant flow through the channels without the difficulty and expense associated with the creation of channels of identical length with tight tolerances (Col 3 lines 14-25). Yang et al. also teach that the requisite pressure drop, which depends on a number of factors including fuel cell operating conditions (i.e. flow rate and temperature), the material and construction of the bipolar plate channels, and channel geometry (Col 1 lines 65-67) (Col 2 lines 1-4).

Therefore, it would have been within the skill of the ordinary skill in the art at the time the invention was made to configure the throttles and the branch flow paths of so that the pressure loss at the throttle is larger than the claimed amount of pressure loss

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at the branch flow path. *Discovery of optimum value of result effective variable in known process is ordinarily within skill of art.* In re Boesch, CCPA 1980, 617 F.2d 272, 205 USPQ215.

### **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ben Lewis whose telephone number is 571-272-6481. The examiner can normally be reached on 8:30am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Susy Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Ben Lewis

Patent Examiner  
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SUPERVISORY PATENT EXAMINER